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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,694	12/04/2003	Tom Francke	19200-000026/US	5644
30593	7590	03/23/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			KAO, CHIH CHENG G	
P.O. BOX 8910			ART UNIT	PAPER NUMBER
RESTON, VA 20195			2882	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/726,694

Applicant(s)

FRANCKE ET AL.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/4/03, 6/25/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because the abstract may not exceed 150 words in length. Correction is required. See MPEP § 608.01(b).

### *Claim Objections*

2. Claims 1, 3-5, 8-10, 12, 15-18, and 20 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (claim 1, line 12, “the line detector unit”; replacing “the” with - -a respective- -), (claim 1, line 15, “the respective fan-shaped coherently scattered”; inserting - -respective- - before “substantially” in line 10 of claim 1), (claim 1, line 18, “charges or photons generated”; inserting a comma before “generated”), (claim 1, line 20, “the line detector unit”; inserting - -respective- - before “line detector”), (claim 1, line 28, “composed of radiation”; replacing “of” with - -from- -), (claim 3, line 7, “separated, elongated and directed”; inserting a comma after “elongated”), (claim 3, line 9, “detect therefore”; replacing “detect therefore” with - -therefore detect- -), (claim 3, lines 11-12, “each of said line detector unit”; replacing “unit” with - -units- -), (claim 4, line 5, “the plane”; replacing “the” with - -a- -), (claim 5, line 2, “the path”; replacing “the” with - -a- -), (claim 5, line 3, “the transmission”; deleting “the”), (claim 5, line 4, “with said simultaneous”; deleting “said”), (claim

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8, line 3, “arrangement relative said examination object”; inserting - -to- - after “relative”), (claim 8, line 9, “being composed of radiation”; replacing “of” with - -from- -), (claim 9, line 3, “arrangement relative said examination object”; inserting - -to- - after “relative”), (claim 9, line 10, “being composed of radiation”; replacing “of” with - -from- -), (claim 10, line 11, “separated, elongated and arranged”; inserting a comma after “elongated”), (claim 12, line 4, “with said simultaneous”; deleting “said”), (claim 15, line 3, “source relative said examination object”; inserting - -to- - after “relative”), (claim 15, line 8, “being composed of radiation”; replacing “of” with - -from- -), (claim 16, line 7, “the trajectory”; replacing “the” with - -a- -), (claim 16, line 10, “the line detector unit”; replacing “the” with - -a respective- -), (claim 16, line 15, “the respective fan-shaped coherently scattered”; inserting - -respective- - before “substantially” in line 9 of claim 16), (claim 16, line 18, “photons generated by interactions”; inserting a comma after “photons”), (claim 16, line 28, “composed of radiation”; replacing “of” with - -from- -), (claim 17, line 13, “separated, elongated and directed”; inserting a comma after “elongated”), (claim 17, line 15, “detect therefore”; replacing “detect therefore” with - -therefore detect- -), (claim 17, lines 17-18, “each of said line detector unit”; replacing “unit” with - -units- -), (claim 18, line 8, “the trajectory”; replacing “the” with - -a- -), (claim 18, line 17, “photons generated by interactions”; inserting a comma after “photons”), (claim 18, line 26, “separated, elongated and directed”; inserting a comma after “elongated”), (claim 18, lines 27-28, “detect therefore”; replacing “detect therefore”; with - -therefore detect- -), (claim 20, line 1, “of claim 19 said line detector”; inserting - -wherein- - before “said line detector”), and (claim 20, line 1, said line detector units”; replacing “units” with - -unit- -).

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For purposes of examination, the claims have been treated as such. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 15, the phrase "optionally" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d). The claim has been examined as best understood by the Examiner as follows.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komardin et al. (US Patent 6175117) in view of Francke (US Patent 6476397).

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5. Regarding claim 1, Komardin et al. discloses an apparatus and method comprising a radiation source arrangement for creating a radiation beam (fig. 10, #30) centered around an axis of symmetry (fig. 10, axis defined by #42), which radiation beam is directed through an examination object (fig. 10, #32), and a radiation detector arrangement comprising a stack of detector units (figs. 1-4, #28), each being directed towards a small portion of a trajectory of said radiation beam in said examination object to allow a respective substantially fan-shaped ray bundle of said radiation beam (fig. 1, beams to #40) as coherently scattered (col. 3, line 44) in said examination object to enter a respective detector unit and be detected therein, said detector units are formed and oriented (fig. 4, #28) so as to allow simultaneous recording of coherent scatter imaging data (col. 4, lines 40-44) sufficient to form a plurality of one-dimensional images, each being composed from radiation coherently scattered in said examination object in a respective angle (fig. 1).

However, Grodzins et al. does not specifically disclose ionizing radiation and wherein each line detector unit has an elongated opening for entry of the respective fan-shaped ray bundle, a row of individual detector elements arranged essentially parallel with said elongated opening, and is of the kind wherein charges or photons, generated by interactions between the respective fan-shaped ray bundle and a detection medium within a respective line detector unit and traveling in a direction essentially perpendicular to the respective fan-shaped ray bundle, are detected by said row of individual detector elements formed and oriented in a respective angle.

Francke teaches ionizing radiation (title) and wherein each line detector unit has an elongated opening (fig. 7, #9) for entry of the respective fan-shaped ray bundle (col. 12, lines 42-43), a row of individual detector elements arranged essentially parallel with said elongated

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opening (fig. 6, #47), and is of the kind wherein charges or photons, generated by interactions between the respective fan-shaped ray bundle and a detection medium (col. 5, lines 1-5) within a respective line detector unit and traveling in a direction essentially perpendicular to the fan-shaped ray bundle (fig. 1), are detected by said row of individual detector elements formed and oriented in a respective angle (fig. 7, #9).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Komardin et al. with the radiation and detector elements of Francke, since one would be motivated to make such a modification to improve spatial and energy resolution (col. 1, lines 50-60) and to lower costs (col. 1, lines 60-65) as shown by Francke.

6. Regarding claims 3, 10, and 16, and for purposes of being concise, Komardin et al. as modified suggests an apparatus and method as recited.

However, Komardin et al. does not specifically disclose openings of line detector units being parallel with substantially line-shaped cross-sections of a radiation beam, the row of detector elements of each of said line detector units essentially orthogonal to a plane, in which said axis of symmetry and said stack of line detector units are located, and the detector elements of each of said line detector units are separated, elongated, and directed so their extension lines converge in a respective point in said different small portions, and therefore detect different angular positions of the fan-shaped ray bundle entered into the respective line detector unit so that a signal from each of said line detector units is needed to form each of said plurality of one-dimensional images.

Francke teaches openings of line detector units (fig. 7, #9) being parallel with substantially line-shaped cross-sections of a radiation beam (fig. 7, #1), the row of detector elements (figs. 5 and 6, #47) of each of said line detector units (fig. 7, #9) essentially orthogonal to a plane, in which said axis of symmetry (fig. 7, middle ray of #1) and said stack of line detector units (fig. 7, #9) are located, and the detector elements of each of said line detector units are separated (fig. 5, #47), elongated, and directed (fig. 6, #47) so their extension lines converge in a respective point, and therefore detect different angular positions of the fan-shaped ray bundle (fig. 7) entered into the respective line detector unit so that a signal from each of said line detector units is needed to form each of said plurality of one-dimensional images (col. 11, lines 3-4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Komardin et al. as modified above with the radiation and detector of Francke, since one would be motivated to make such a modification to improve spatial and energy resolution (col. 1, lines 50-60) and to lower costs (col. 1, lines 60-65) as shown by Francke.

7. Regarding claims 2, 4, 11, and 17, Komardin et al. further discloses detector units (fig. 6a, #28) directed towards different positions (fig. 6a, left and right positions in #32 defined by scattered beams to #40) along the trajectory of the radiation beam in said examination object (fig. 6a, #32) to allow different fan-shaped ray bundles of said radiation beam as coherently scattered (col. 3, line 44) in different small portions of said examination object to enter said detector units and be detected therein so that a signal from each of said detector units (fig. 4, #28) is needed to



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form one of said plurality of one-dimensional images (col. 4, lines 40-44), and which directions define angles (fig. 6a, beam on far right and far left) with respect to said axis of symmetry in a plane (fig. 6a, axis going from #20 to 28), in which said axis of symmetry and said stack of detector units are located, which angles have the same magnitude (fig. 6a, beam on far right and far left).

8. Regarding claims 5 and 12, Komardin et al. further discloses the radiation detector arrangement comprising a detector unit (fig. 9, #28) arranged in a path of said radiation beam (fig. 9, #30) to measure transmission (fig. 9, #38) through said examination object (fig. 9, #32) simultaneously with simultaneous recording of coherent scatter imaging data (fig. 9, #40).

9. Regarding claim 6, 7, 13, and 14, Komardin et al. as modified above suggests an apparatus as recited above.

However, Komardin et al. does not disclose a gaseous-based parallel plate, avalanche amplification detector.

Francke further teaches a gaseous-based parallel plate (fig. 5, #53), avalanche amplification (col. 1, lines 50-56) detector.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Komardin et al. as modified above with the detector of Francke, since one would be motivated to make such a modification to improve spatial and energy resolution (col. 1, lines 50-60) and to lower costs (col. 1, lines 60-65) as shown by Francke.

10. Regarding claims 8, 9, and 15, Komardin et al. further discloses a device for moving said radiation source and detector arrangement relative to said examination object in two different directions in a plane (fig. 11, #70) orthogonal to said axis of symmetry (fig. 11, axis defined by beam from #20 to 28), while said detector units (fig. 11, #28) are together adapted to record a plurality of images of radiation as scattered in said examination object (fig. 11, #32) in a plurality of different angles (fig. 11, angles created by #70) to thereby produce coherent scattering imaging data sufficient to form a plurality of two-dimensional or three-dimensional images (col. 11, lines 55-63), each being composed from radiation as coherently scattered in said examination object in a respective angle.

11. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grodzins et al. (US Patent 6442233) in view of Francke (US Patent 6476397).

Grodzins et al. discloses an apparatus comprising a radiation source arrangement for creating a collimated radiation beam (fig. 2a, #10) centered around an axis of symmetry (fig. 2a, axis defined by beam going to #26), which radiation beam is directed through an examination object (fig. 2a, #18), and a line detector unit (fig. 2a, #28) being directed towards a small portion of a trajectory of said radiation beam (fig. 2a, beams including #48) in said examination object to allow a substantially fan-shaped ray bundle of said radiation beam as coherently scattered (title) in said examination object to enter the line detector unit and be detected therein; wherein said line detector unit has an elongated opening (fig. 2a, opening from #50 past #59) for entry of the fan-shaped coherently scattered ray bundle, a row of individual detector elements arranged

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essentially parallel (fig. 2a, row including #50, 52, 57, and 59) with said elongated opening, the row of detector elements of said line detector unit is essentially orthogonal (fig. 2a, line of #28) to said axis of symmetry (fig. 2a, line from #10 to #26), and the detector elements of said line detector unit are separated, elongated, and directed (fig. 2a, #50 and 58) so their extension lines converge in a single point in said small portion, and therefore detect different angular portions (fig. 2a, #46 at least) of the fan-shaped ray bundle entered into the line detector unit.

However, Grodzins et al. does not specifically disclose ionizing radiation and a row of individual detector elements of the kind wherein charges or photons, generated by interactions between the fan-shaped ray bundle and a detection medium within the line detector unit and traveling in a direction essentially perpendicular to the fan-shaped ray bundle, are detected by said row of individual detector elements, wherein said line detector unit is a gaseous-based parallel plate, avalanche amplification detector.

Francke teaches ionizing radiation (title) and a row of individual detector elements of the kind wherein charges or photons, generated by interactions between the fan-shaped ray bundle and a detection medium (col. 5, lines 1-5) within the line detector unit and traveling in a direction essentially perpendicular to the fan-shaped ray bundle (fig. 1), are detected by said row of individual detector elements (fig. 7, #9), wherein said line detector unit is a gaseous-based parallel plate (fig. 5, #53), avalanche amplification (col. 1, lines 50-56) detector.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Grodzins et al. with the radiation and detector elements of Francke, since one would be motivated to make such a modification to

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improve spatial and energy resolution (col. 1, lines 50-60) and to lower costs (col. 1, lines 60-65) as shown by Francke.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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